Remarks/Arguments

Claims 2, 10, and 18-32 have been cancelled. Claims 1 and 15 have been amended to recite that the concentration of water is less than 0.1%. Support for this amendment is found at Page 7, lines 10-14. No new matter is added thereby. Claims 3-9, 11, and 16-17 have been amended to recite that the concentration of water is less than 0.1% by virtue of dependency from claims 1 and 15, respectively. No new matter is added thereby.

Claims 1, 3-9, and 11-17 remain in this application.

The examiner had rejected claims 1-32 under 35 USC 103(a) as being unpatentable over Byatt et al (US 6,161,426) in view of Saunders (US 3,727,049) and Chou (US 6,049,728). The examiner notes that Byatt et al. teaches that "[p]hotoacoustic sensors for trace analysis in liquids, and, in particular, of oil in water are known" citing column 1, lines 45-46). Notably, Byatt does not teach the detection of trace levels of water in oil at levels of less than 0.1%, as is now claimed by the applicant. The examiner further notes that Saunders teaches that it is known in the art to use spectroscopic methods measure water in oil products such as fuel, citing column 1, lines 50-58. Notably, Saunders does not teach a photoacoustic technique, as claimed by the applicant, nor does Saunders teach the detection of trace levels of water in oil, as now claimed by the applicant. Instead, Saunders points out the drawbacks of the prior art, which were overcome by the present invention. The examiner argues that Chou teaches that photoacoustic measurements are "relatively immune to turbid conditions" and then suggests that "given the teaching of Saunders that scattering can be a significant problem in measuring water in oil, those in the art would have been motivated to use a technique, such as a photoacoustic technique, which is known to be insensitive to such scattering."

The examiner's articulation of how one skilled in the art might be motivated to combine Chou, Saunders and Byatt may appear reasonable as an initial impression. However, it is simply not consistent with the experience of those in the industry.

To gain the perspective of those having skill in the art, the applicant sought the opinions of Dr. Mark Barnes. As noted in his affidavit, which is entered into the record concurrently herewith, Dr. Barnes has been heavily involved in the oil analysis industry for at least the past eight years. As the Technical Editor of Practicing Oil Analysis Magazine, and the Associate Technical Editor of Machinery Lubrication Magazine, Dr. Barnes is well versed both in the industry's needs and in the technologies available within the industry. Further, his experience with commercial oil analysis labs, including setting up and managing oil analysis programs for manufacturing, power generation, pulp and paper, forestry, fleet and mining clients, and 5 years experience teaching oil analysis best practice classes, insure that Dr. Barnes can credibly document the capabilities and the needs of the industry.

Dr. Barnes' conclusion, that "[p]rior to the techniques described and claimed by Dr. Amonette and Dr. Autrey in the above captioned patent application, there had long existed a need in the field of oil analysis for methods which would allow the detection of water in oil at concentrations of less than 0.1% utilizing instrument based techniques" thus stands as a refutation to the assertion that those in the art would have been motivated to combine the teachings in the manner suggested by the examiner. Dr. Barnes further conclusion that "those having skill in the art had long desired a technique that would allow real-time, on-line analysis that was not possible utilizing the available wet chemistry techniques" and "[t]he use photoacousticspectroscopy, as described and claimed by Dr. Amonette and Dr. Autrey in the above captioned patent application, therefore provided for the first time the ability to detect water in oil in a manner that allowed on-line, real-time analysis and [t]he technique thereby fulfilled what had been a long felt need by those having skill in the art" provides an overwhelming case that, despite the combination suggested by the Examiner, the technique taught and claimed in the instant application was not obvious to those having ordinary skill in the art.

As set forth by the Federal Circuit, "Evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an

invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decision-maker remains in doubt after reviewing the art." Stratoflex, Inc. v Aeroquip Corp., 713 F.2d 1530, 1538-40, 218 USPQ 871, 879 (Fed. Cir. 1983).

The Affidavit of Dr. Barnes is concerned entirely with one such secondary consideration; the fact that the present invention filled an existing need. Again, as stated by the Federal Circuit, "Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light. Such objective indicia as commercial success, or filling an existing need, illuminate the technological and commercial environment of the inventor, and aid in understanding the state of the art at the time the invention was made." Continental Can co. USA v. Monsanto Co., 948 F.2d 1264, 20 USPQ 2d 1746, 1752 (Fed. Cir. 1991).

When taken together with the binding Federal Circuit precedent, Dr. Barnes' affidavit compels a finding of non-obviousness. Dr. Barnes' affidavit establishes conclusively that the "objective indicia" of "filling an existing need" was met by the above captioned patent application. Further, the Saunders reference is consistent with the "existing need" described by Dr. Barnes. At column 8, line 53, Saunders shows that an actual concentration of 1.0% water in oil in measured by the Saunders method as 0.7%, demonstrating a level of error in Saunder's method of spectrophotometography that is overcome by the present invention. Having established an existing need was met, Dr. Barnes' affidavit becomes "the most probative and cogent evidence in the record" and establishes "that an invention appearing to have been obvious in light of the prior art was not."

Applicant has made an earnest attempt to place the above referenced application in condition for allowance and action toward that end is respectfully requested. If the not allowed, the applicant respectfully requests that the amendments to the claims and the affidavit of Dr. Mark Barnes nevertheless be entered into the record. Should the

Examiner have any further observations or comments, she is invited to contact the undersigned for resolution.

Respectfully submitted,

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The undersigned hereby certifies that the forgoing Amendment dated August 25, 2003 in reply to the office action of April 23, 2003, together with a fee sheet (USPTO form PTO/SB/17), the affidavit of Dr. Mark Barnes (1 page) and a return postcard are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

on the date set forth below.

Douglas E. McKinley, Jr.
Reg. No. 40,280

August 25, 2003
Date